Method and Mapping of Trust and Trustworthiness in Agroindustry Logistic and Supply Chain: A Systematic Review

Rindra Yusianto[#1], Sambas Sundana[#2], Marimin[*3], Taufik Djatna[*4]

[#*]*Department of Agro-industrial Engineering, Faculty of Agricultural Technology, IPB University (Bogor Agricultural University), Indonesia*

[1]rindra@staff.dinus.ac.id
[2]sambas_sundana@univpancasila.ac.id
[3]marimin@ipb.ac.id
[4]taufikdjatna@apps.ipb.ac.id

***Abstract*— Trust and trustworthiness are very important in agroindustry logistic and supply chain. The objective of this article is to analyse the existing methods and approaches for trust and trustworthiness to develop a new framework in agroindustry logistics and the supply chain from shipment planning, routing and scheduling, shipping and inventory control. This paper reviewed and synthesized 84 scientific articles which were published between 2009 and 2019. The reviewed articles were categorized into contract, competencies, goodwill, and performance. The potentials identified for future research were the importance role of management in maintaining trust and trustworthiness in the supply chain system. Most previous authors have applied an approach of interaction and impact on collaborative relationship and performance in supply chains. The dominant methods found in literature were contractual and impact on relationship quality. Most of the literature focuses on managing trust relationships and there is a lack of discussion about the relationship of trust in shipment planning, routing and scheduling, shipping and inventory control. The contribution of this paper was mapping the method in relationship of trust, trustworthiness and develop new framework. This paper developed and suggested a new framework for maintaining trust and trustworthiness in the agroindustry logistic and supply chain model.**

Keywords*—*agroindustry, logistic, supply chain, trust, trustworthiness

1. Introduction

Since the 1990s, logistics and supply chains have been of considerable research concern. The main focus of previous research is how to reduce the decisions of suppliers, producers and retailers, to minimize total cost and to minimize delivery time of product to costumer, develop costumer value-adding, maximize profit and maintain competitive advantage and service level [1][2][3][4]. An important element of logistics and supply chain is trust, between all members and behavior in all fields of business [5][6][7]. Trust is an important element for modern logistics and supply chains, because it provides an important and necessary basis for work distribution activities and the establishment of new methods for directing the work of organizational members within the framework of logistics and supply chains [8]. Trust is an essential aspect of any relationship that can improve the quality of relationships [9] [10], reduce transaction costs [11], reduces the need to write complicated, costly, and difficult to enforce contracts between organizations and increasing supply chain performance [12][13].

Previous researchers have agreed and indicated that trust is a relational attribute that must be analyzed in situations related to vulnerability and risk [14]. The definition of trust in general is a condition where psychologically consisting of an invention to accept vulnerability based on the desires and expectations of behavior of others [15]. In fact, trust is essential. We cannot do everything ourselves or check the evidence for everything we believe [16]. However, in reality it is difficult to build trust and deep confidence in the long term [7]. Consumer confidence needs to be built and has become an important goal in the agro-industry sector. They have efforts to protect trust in agro-industry and government, and tend to regard the issue of trust as a problem in informing consumers, including risk. [17]. Any governments and industries should be able to verify the trustworthiness of a particular identity and decide by itself how much trust it will place on the verification [18].

This paper aims to mapping the method and approach in relationship of trust, trustworthiness and develop new framework for maintaining trust in the agroindustry logistic and supply chain model from order and shipping planning, routing and scheduling, shipping execution, and inventory control process. By reviewing current literature, it summarizes four major trends. The first trend is the analysis of contractual trust. The second trend views competence trust. The third trend is the analysis of goodwill trust. And the fourth trend views a conceptual definition and framework for performance trust will be mapped and further possible improvement will be discussed.

2. Literature review

2.1 Type of Trust

Trust in logistics and supply chains is a willingness of one party in a supply chain to be vulnerable to the behavior and activities of other parties, where the other party is able to take certain actions that are important to the trustee, in addition to the ability to regulate or monitor other parties [19]. Trust is usually specified in terms of a relationship between a trustor and a trustee [20]. Trust forms the framework of respect for the importance of the flexibility of human relations [17]. Cognitive processes can be used to develop trust, namely by distinguishing between people and institutions that can be trusted, not trusted, and unknown. In a cognitive definition, we choose who we will believe in, in what terms and under what circumstances. Evidence of trust can be realized by showing our better choices in what we consider to be good reasons.

In previous research, trust was divided into three types. These three trusts are contractual, competence and goodwill. Contractual trust is based on shared moral norms, such as honesty, whereas a belief in competence usually requires knowledge and understanding of technical standards together, professional behavior and managerial. Trust in goodwill will usually occur if there is consensus regarding the principles of justice [21]. Some researchers with the subject of trust have previously defined trust as a psychological study consisting of one's intention to accept vulnerability that comes from compassion from the behavior of others, as a reward for some positive expectations from that person. Trust is not behavior or choice (risk adoption), but it is a fundamental psychological condition that can lead to such actions.

2.2 Trust and trustworthiness in agroindustry

Many authors have developed logistical and supply chain definitions over time, according to topics or periodical problems. This might also contribute to a large number of definitions and misconceptions. As a result, no universal definitions for logistics and supply chains can be adopted [22]. Logistics defined comprehensive actions that integrate planning, implementation, control of raw materials, transportation, storage, loading, unloading, packaging, and shipping [23]. At present, more specifically logistics can be seen from two perspectives namely internal or external perspective. The internal perspective focuses on the efficiency that will be achieved through the coordination of internal material flow. It is attached to concepts such as productivity, time and cost. Whereas the external perspective explains the material flow from beginning to end in the entire supply chain, it focuses on external material flow and distribution efficiency [22].

Regarding trust and trustworthiness in logistics and supply chains, the literature review is divided into two levels of analysis [24]. First, studies related to horizontal collaboration are reviewed and discussed, focusing on the objectives to be achieved, the role of the existing trust model. This horizontal collaboration is based on openness, mutual trust, mutual risk, and mutual rewards that produce competitive advantages, in order to achieve better performance [25]. Logistics and supply chain performance may be unique and usually differ for each organization, and will generally reflect the objectives and the surrounding environment [26]. Second, organizational theory that investigates interactions between companies is analyzed in order to be able to know how the key can contribute to the topic of choice. The logistics and supply chain model consists of a number of agents that are in the supply chain layer [27]. Layers can match suppliers, manufacturers, distributors, and retailers [28]. In agroindustry logistics and supply chains, the layer begins with order, shipment planning, routing and scheduling, shipping and inventory as shown in Figure 1.

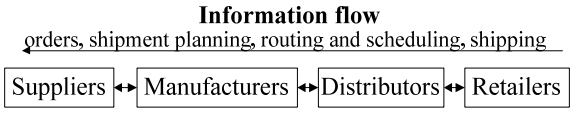

Figure 1. Information flow in logistic concept

The firms can be more familiar to each other with the concept of collaborative logistics and supply chain approaches. The manufacturing industry obtains raw materials form supplier or collector (collection center). Customer demand, at the retailer's node, usually follows normal distribution. Retailers carry inventory, in addition to replenishing stock from distributors as needed and are controlled by inventory control. When a retail orders an item of the goods, the distributor immediately fulfills the full order after checking the availability of the goods [25]. In logistics and supply chains, suppliers will send goods to manufacturers that are nearer, where suppliers have the preferences or goods that manufacturers need. For example, suppliers may require high-quality materials from manufacturers, with three criteria: 70% quality, 20% price, and 10% time. In this case, quality is the most influential and important factor. In this model, trust by downstream agents in upstream agents is maximized when the last agent provides goods at low prices and good quality on time [27].

3. Method

3.1 Critical review framework

In this critical review, we have categorized these critical reviews as four main topics; they are contractual trust, competence trust, good faith or goodwill trust, and performance trust. Trust configuration models are mostly discussed in the previous literature and will be described ini detail in this study. Trust topics explained the definitions, factors and methods in previous literatures.

This critical review study focuses on the approaches and methods applied by the authors for feasibility and trust ini logistics and supply chains agroindustry. What me mean by logistics and supply chains agroindustry is ordering goods, shipping planning, routing and scheduling, shipping execution, and inventory control processes and we will define a new framework.

The performance trust and trustworthiness is the decision-making framework to implement the maintaining trust in the agroindustry supply chain model. Finally, a global logistical and supply chain agroindustry framework will be suggested at the end of this review. The framework and structure in reviewing the performance of trust and trustworthiness in logistics and agro-industry supply chains which include the activities of order and shipping planning, routing and scheduling, shipping execution and inventory control processes are illustrated in Figure 2.

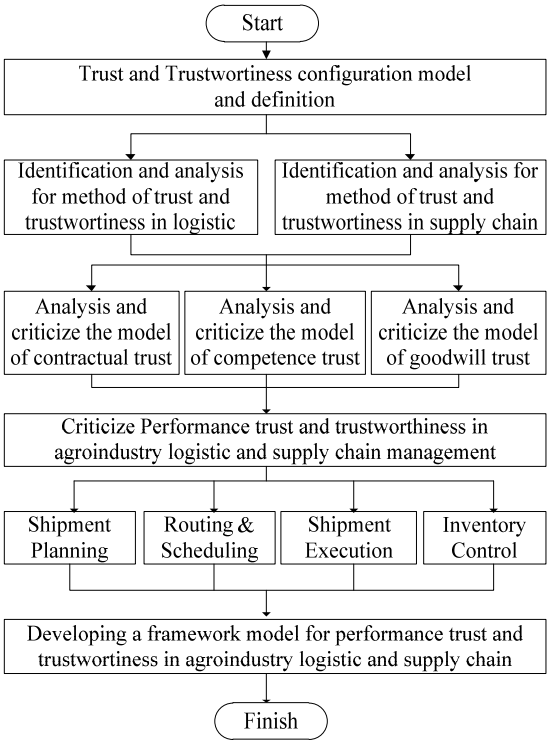

Figure 2. The review framework and structure

3.2 Scientific articles sources and the year of publication

We have reviewed 84 scientific articles correlated to our main topics. The scientific articles are 78 Journals, 4 Books, and 2 Proceedings which published between 2009 and 2019. After collecting the literature, we then classify it into main topics based on the topic and year of publication. Regarding novelty, we have taken the publication year for the past 10 years. Our publications are also sorted by number of citations. A variety of literature related to trust and trustworthiness in logistics and supply chains which are classified into the main topics as in Table 1 and the classification by year of publication in detail can be seen in Figure 3.

Table 1. The number of articles on each main topic

No	Main Topic	Quantity	%
1	Contractual Trust	32	38%
2	Competence Trust	24	29%
3	Goodwill Trust	7	8%
4	Performance Trust	21	25%
	Total	84	

Table 1 and Figure 3 show the trust and trustworthiness in agroindustry logistics and supply chains which have become a general topic in the last 10 years. Most literature is related to the topic of contractual trust then competence trust, performance trust, and finally goodwill trust.

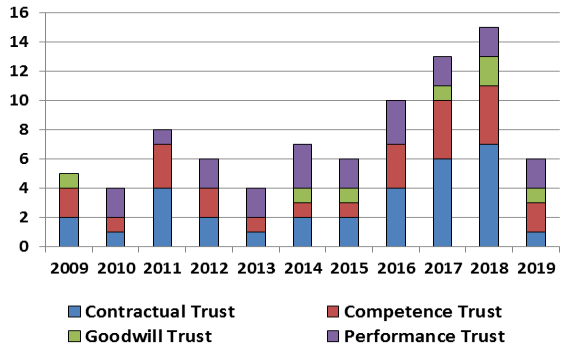

Figure 3. Temporal distribution of the articles

Even today there are smart contracts using various information technology-based approaches. In 2014, most scientific articles related to the main topics of trust and trust were available and based on Figure 3 can be seen precisely after 2015, except for 2019 data that we collected have not reached the end of the year. We can interpret that this main topic is still likely to be developed, explored and explored more deeply with new approaches, methods and frameworks.

4. Finding

Trust and trustworthiness can be important and interesting topics to discuss. Almost all activities may be related to trust and trustworthiness. Investigations in various disciplines, including psychology, ethics, management, economics, sociology, and agro-industry [29][30][31].

4.1 Configuration model

In trust, relationships can be one-on-one relationships between trustor and trustees, a many-to-one or one-to-many relationship, for example, a machine operator with the head of a machine, and a many-to-many relationship such as mutual openness and mutual trust between operators within a company [32][33].

Based on the critical review of literatures, the behavior of the logistic and supply chain in agroindustry is trustworthy [30], we found different criteria of trust and trustworthiness (Cc) as the following: fairness (Ho), credibility (Cr), experience (Ex), competence (Co), sincerity (Si), predictability (Pr), transparency (Tr), goodwill (Gw), commitment (Cn), mutual respect for confidentiality in the exchange of information (Rs), general communication skills (Cs), shared values (Sv), equality of work (Si), sharing of work methods (Sh), and influence in the supply network (In) [34].

Trust in this case is all predetermined criteria then averaged as can be seen in in "Eq. (1)"

$$Cc = (\alpha.Ho + \beta.Cr + \gamma.Ex + \delta.Co + \varepsilon.Si + \zeta.Pr + \eta.Tr + \theta.Gw + \iota.Cn + \kappa.Rs + \lambda.Cs + \mu.Sv + \nu.Si + \xi.Sh + o.In)/(\alpha + \beta + \gamma + \delta + \varepsilon + \zeta + \eta + \theta + \iota + \kappa + \lambda + \mu + \nu + \xi + o) \quad (1)$$

Literature sometimes does not determine the exact weight of each criterion and the value of each criterion is generally subjective. In this study it is assumed that overall is equal to 1. Behavior representing trust in this study is expressed as in "Eq. (2)"

$$Cc = (Ho + Cr + Ex + Co + Si + Pr + Tr + Gw + Cn + Rs + Cs + Sv + Si + Sh + In)/15 \quad (2)$$

Based on the Cc calculation, the degree or level of trust and trustworthiness behavior is classified in the scale of the proposal as can be seen in Figure 4.

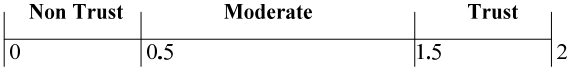

Figure 4. Classification of trust level

In Figure 4 it can be seen that trust and trustworthiness between 0 and 0.5 are behavioral distrust, while a scale between 0.5 and 1.5 is moderate and a scale between 1.5 and 2.0 is trust. Non-trust, moderate and trust are determined by

using a collaboration model using quality in sharing information. Significant study is still needed on how to achieve collaboration based on trust and trustworthiness in logistics and supply chains especially for agroindustry activities [35]. Collaborative is beneficial in identifying information flow [2]. Information sharing can facilitate the presentation of data, traceability and help decision makers [36][37]. The trust that determines the level of collaboration receives stronger support from some of the literature in this critical review [38][39]. In an effort to achieve flexibility, trust remains important and is able to ensure that information flows reliably in logistics and throughout the supply chain, challenges remain regarding how trust based collaborative relationships can be realized and maintained [35][40]. The mechanism of coordinating relationships in cooperation needs to be distinguished between one type of trust and another which refers to the theory of reciprocity [33]. Slow coordination can lead to main constraints and mistrust of stakeholders in logistics and supply chains [41]. More importantly, we believe that these benchmarks can help understand logistics and supply chains [42]. Relationships need to be maintained regarding trust in logistics and supply chains [43].

Based on critical reviews from various previous literature, trust related to collaboration, relationships, coordination and benchmarks can be described can be described as in Figure 5.

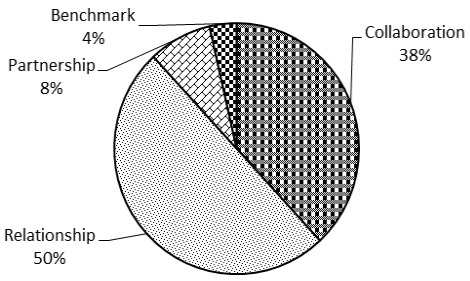

Figure 5. Trust and trustworthiness configurations in literatures

4.2 Point of View of trust and trustworthiness

In logistics and supply chains, the degree or level of trust and trustworthiness can be raised by reducing and minimizing opportunism [44]. Opportunism which is reduced and minimized by intention building trust requires identification of the criteria demonstrated by the behavior of the pre-imaging practice exhibited. In logistics and supply chains, modeling of trust and trustworthiness is a crucial and important aspect, especially from a sustainability perspective. In logistics and supply chains, the more we trust, that trust can provide hope for exchanging information for example about customer estimates, stock levels and how suppliers are chosen. [34].

Trust configuration model of supply chains constructed from two dimensions, direct and indirect [45]. The supply chain network composes two parts, the supply chain link with products as core and the interactive network of all enterprises produced by the interaction of products. Under the traditional environment, all trade is led by core nodes in the supply chain. And enterprises that do not have direct transactions will store trade information separately, so that the value of trust cannot be evaluated up to the aid of object valuation from related enterprise. Because of the transparency of information, the evaluation of trust between indirect enterprises can be carried out based on the actual transaction information, which is more scientific. The association credibility refers to the degree of trust between two relevant enterprises without direct transactions. The relationship among enterprise i, enterprise j, and relevant enterprises are showed in Figure 6.

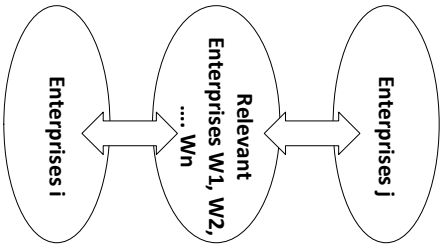

Figure 6. The association credibility enterprise

This method is grouped into two types of views namely channel and market appearance. What needs to be noticed is that channel display usually approaches interaction points in logistics and along the value chain, however the relationship between main firms and suppliers, collectors, distribution centers, transporters and end customers remains the main focus. The market view approach to competition focuses on cause and effect relationships with sustainable competitive advantage and logistical influence in the supply chain [22].

4.3 Analysis and criticize model trust

To explore the nature of trust such as its constructing components and factors, there are many literatures. To demonstrate the original nature and functions of trust, Sako in 1992, further classified into three categories of trust as contractual trust, competence trust, and goodwill trust [7]. This can be seen in Table 2.

Table 2. Aspect of trust

Trust	Trust and trustworthiness factors
Contractual	Promise [46][47] Reliability [48][49][50] Predictability [51][52] Credibility[53][53][54][55] Fairness [40][56][57][58]
Competence	Cognitive [59][60][61] Competence [62][63][64][45] Ability [65][66] Work standard [67][32] Experience [68][69]
Goodwill	Openness [70] Relationship equity [71][72] Goodwill [73][74] Honesty [75] Integrity [76] Faith [77]

To summarize the components of trust, three main aspects (Table 2) can be seen as contractual (trust based on contract, agreement and fairness), competence (trust based on skills, capability and qualifications), and goodwill (trust based on relations, benevolence and shared values).

4.3.1 Model of contractual trust

The increasing development of modern logistics, we also consider the increasing importance of contracts in agro-industry. this phenomenon has become increasingly widespread where formal contracts can play an important role in improving value chains, increasing efficiency and profitability in supply chains [78]. Contractual trust is built upon agreement-similar to dependability [7][79]. In business activities, the relationship between business people will influence investment activities, financing and profitability of the company in the business environment [23]. Transaction costs and trust are the independent variables most often used in contractual relationships. One of the contractual concepts in trust and trustworthiness in logistics and supply chains is using technology. Developing technology is block chain technology. Smart contracts have two semantics: operational and denotation semantics [55]. Operational semantics include parts that can be executed from contracts and denotation, non-operational legal aspects.

Trust in smart contracts is encrypted using code in the form of operational semantics that in fact represent denotation semantics [55]. In This study, we believe that Trust is the main element that supports the success of smart contracts. This framework increases efficiency and practicality using smart contracts for physical assets and non-financial services with emphasis. Its main contribution is ensuring smart contract platforms that can be adopted and practiced [58]. The smart contract model can be seen in Figure 7.

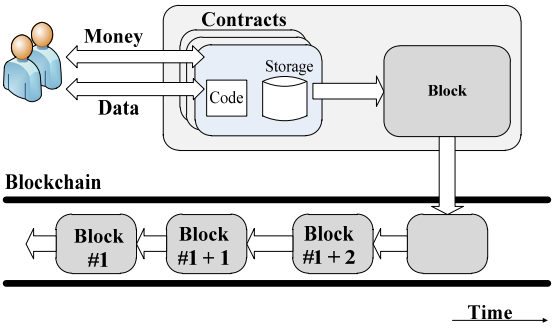

Figure 7. Smart contractual model [58]

Smart contracts are promising technology, but as technology develops, it will be an interesting and serious challenge. Various problems related to trust have been attempted to be solved by previous researchers. non-deterministic external data verification issues, smart contract systems, distribution and transportation, and physical delivery [58]. Previous writers had imagined how smart contract templates could be used based on the ideas of Ricardian Contract theory. Ricardian contracts are all digitally signed in the format (P; C; M), where P is a legal prose that can be interpreted as capturing denotation semantics, C is a platform-specific code that expresses operational semantics, and M is a map parameters used in P and C [55].

4.3.2 Model of competence trust

Competence is defined as individual characteristics, including knowledge, abilities, skills, traits, self-image, thought patterns, feelings, and ways of thinking, when used with appropriate roles, will achieve the desired and desired results. Competence contributes to the exemplary performance of individuals who create reasonable business outcome. The amount of hope a person has regarding his partner in terms of ability and

technical and operational skills, fairness, and competence needed to be able to fulfill an obligation is called competency-based trust. [63]. Society for Human Resource Management (SHRM) develops the competence trust model by considering communication, relationship, ethical practices, knowledge, acumen business, critical evaluation, global and culture effectiveness, leadership and navigation as shown in Figure 8.

Figure 8. Competence trust model

In line with general predictions from the existing literature that emphasize the direct effects of intention-based trust on positive attitudes at work, higher levels of cooperative behavior, and superior levels of performance, people will expect that competency-based trust must have the same effect [64].

4.3.3 Model of goodwill trust

Goodwill trust can reflect recognition regarding the reliability and certainty of commitment from partners in a trust relationship [74] Sako (1992) in his work argued that goodwill trust is related to the commitment of actors [73]. Goodwill trust must be used as the core of trust in creating the effectiveness of policy implementation networks in policy implementation on quality assurance.

Goodwill trust in a partner in doing business will accumulate when the partner has been seen to solve a problem. Solving the problem in question is a fair and more efficient way. The support of competency trust in the relationship between suppliers, collectors, distribution centers, and consumers in an area is called goodwill trust [74]. Relationships between partners, such as manufacturers, suppliers, retailers, and/or re-producers are very important in logistics and supply chains [4]. Trust in competence can be positively correlated with trust in goodwill in a logistics and supply chain relationship as shown in Figure 9.

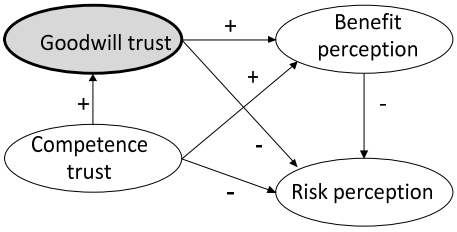

Figure 9. Model of goodwill trust in relationships

5 Discussion

Based on the mapping of trust and trustworthiness methods in the existing literature, a systematic mapping model, level of trust consists of contractual (32 articles), competence (24) and goodwill (7). The level of trust is positively related to the degree of performance. The degree of performance consists of collaboration (32), relationship (42), partnership (7), and benchmarks (3). From degree of performance papers that focus on discussing the performance of 21 papers. The degree of performance determines trust and trustworthiness (84 papers) in logistics and supply chains can be described as shown in Figure 10.

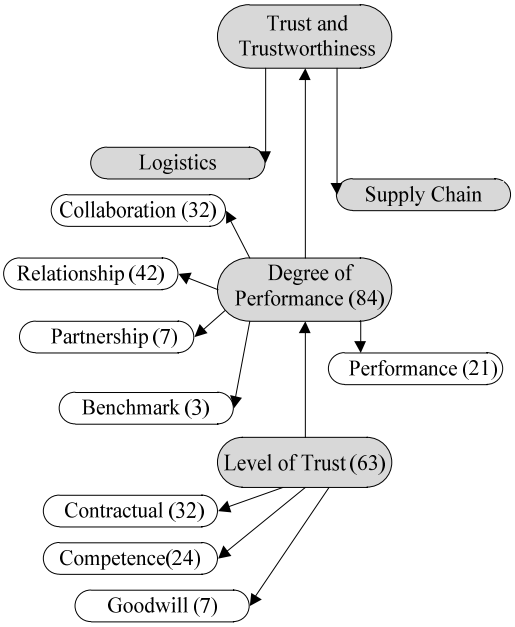

Figure 10. A systematic mapping model

5.1 Gap and future potential exploration

Based on literature, trust and trustworthiness in logistics and supply chains are more discussed about contractual trust, competence trust and goodwill trust. The third discussion focuses on

relationships, collaboration, partnership and benchmarks. Relations in logistics and supply chains are studied more generally, namely the relationship between upstream and downstream, which consists of suppliers, manufacturers, distributors, retailers, and customers. Based on a critical review of the dominant literature that focuses on managing trust relationships, however there is a lack of discussion about trust relationships in the planning of shipping, routing and scheduling, shipping execution and inventory control process performance. The relationship between people and institutions in a supply chain to achieve goals is important [80].

The purpose of this article is to analyze existing approaches and methods for trust and trustworthiness to develop new frameworks in agro-industrial logistics and supply chains. Whereas the main novelty of this paper is that this study focuses on assessing the importance of trust and trustworthiness in the four levels of logistics and supply chain activities namely shipping planning, routing and scheduling, delivery implementation and inventory control processes. The contribution of this paper was mapping the method in relationship of trust, trustworthiness and develop new framework. This paper developed and suggested a new framework for maintaining trust and trustworthiness in the agroindustry logistic and supply chain model by using Enterprises Architect Version 14.0 software.

5.2 Critics for trust, and developing framework for performance trust

The most serious criticism of trust performance is that other factors influence either moderate or intermediate, and inefficiency in making actual performance testing [81]. One of the external factors is share information. The willingness of suppliers, manufacturers, distributors, retailers, and customers to share information determines the effectiveness of the supply chain and higher logistics service performance with a higher level of trust and trustworthiness, commitment and competence [82].

In this paper we can say that collaborative trust influences the positive performance of logistics and agro-industry supply chains on the four logistics and supply chain activities. Whereas based on the existing literature, the relationship is greater than collaboration. This study analyzes the effect of collaborative trust on supply chain logistics and performance through mutually beneficial relationships [83]. Based on the mapping of the literature, performance in agroindustry logistics and supply chains can be formulated as a function of contractual, competence and goodwill as follows:

$$Performance = f(contractual.competence.goodwill) \quad (3)$$

Many researchers have discussed the importance of trust in logistical relationships and supply chains [84].

6 Proposed Model of trust and trustworthiness in logistic and supply chain

In this paper a new framework is developed that considers sharing information using information technology. Share information by accessing the database, from shipment planning, routing and scheduling, processing execution and inventory control processes. It is expected to increase trust between suppliers, manufacturers, distributors, retailers and customers in the logistics agroindustry and supply chain.

Based on the existing literature, it turns out that relationship is the most influential factor in trust and trustworthiness in logistics and supply chains. So that in this new framework, the relationship between suppliers, industry or manufacturers, distributors, retailers and customers is the focus of attention in sharing information-based on supply and demand as shown in Figure 11.

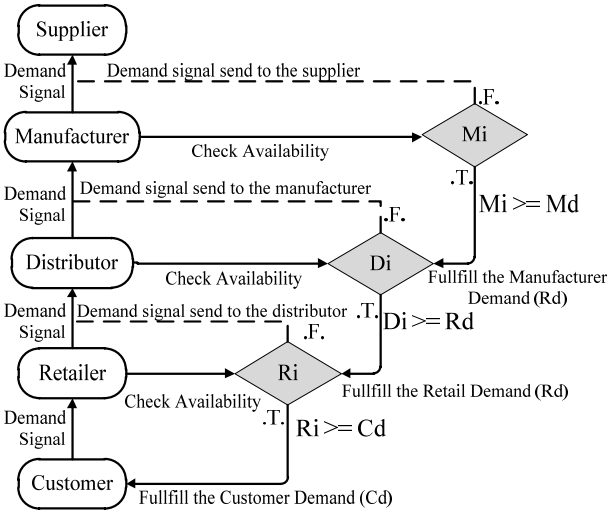

Figure 11. Model of information sharing-based

The customer provides retail demand signals, if Ri (availability of retail stock) is greater than the customer demand (Cd) then fulfill the customer demand, otherwise the retailer will send information to place an order with the distributor. Furthermore, based on demand signals from retailers to distributors, if Di (availability of distributor stock) is greater than the demand (Rd) Retailer, and then fulfill the retail demand,

otherwise the distributor will send information to order to manufacturer. Finally, based on the demand signal from the distributor to the manufacturer, if the Mi (stock availability manufacturer) is greater than the Distributor demand (Dd) then fulfill the distributor demand, otherwise the manufacturer will send information to place an order with the supplier.

In this section the problem is presented to model the trust behavior of the proposed trust and trust in the logistics and supply chain models in agro-industrial development. Our goal in this study is to design efficient models that can be applied to evaluate global performance of logistic and supply chain using Enterprise Architect version 14.0 software. The relationship between databases in the trust and trustworthiness of the shipment planning, routing and scheduling, shipping execution and inventory control process is illustrated in the physical database diagram as shown in Figure 12.

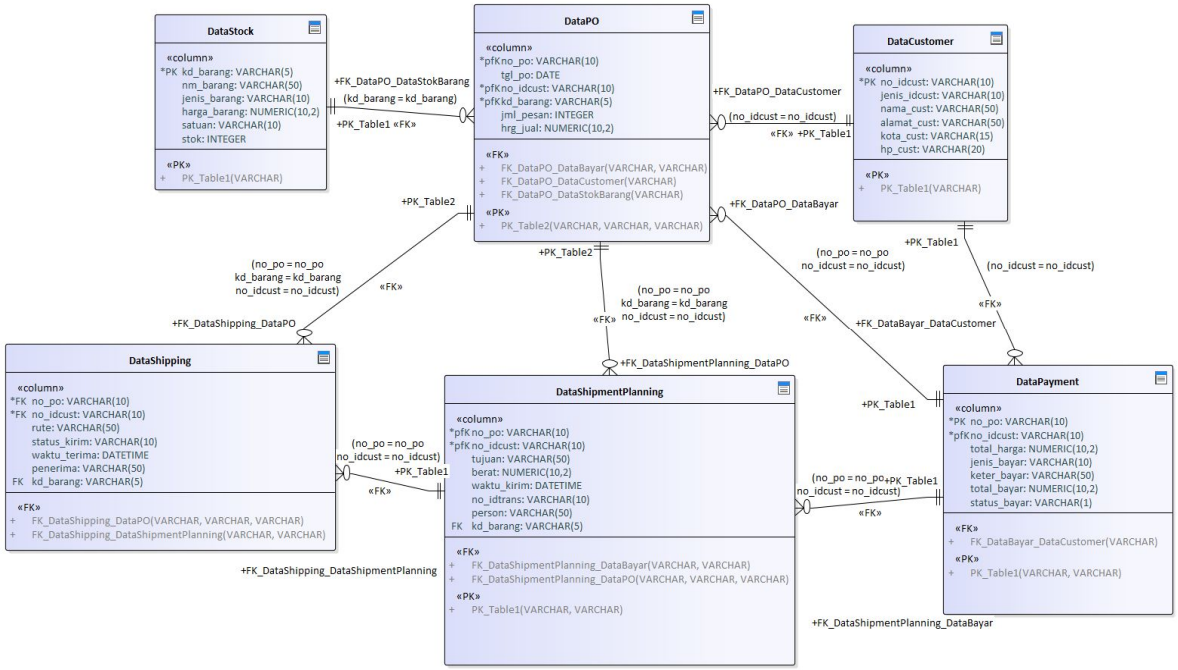

Figure 12. The physical database diagram

The analysis business process model (BPM) for shipment planning involves customer data, stock, payment, Purchasing Orders (PO) as shown in Figure 13.

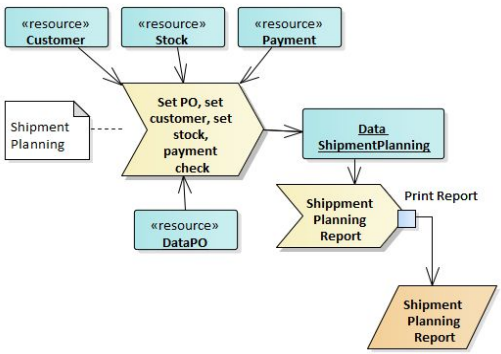

Figure 13. BPM Shipment Planning

In Figure 13 you see that the entire process will be stored in the shipment planning data. Each period will be used to display the Shipment Planning Report

Customer trust is expected to increase by providing customers with access to data shipment planning. Information sharing in addition to fulfill customer needs also provides access to managers to print periodic shipment planning reports. Shipment planning data is used for routing and scheduling. Shipment planning data is used for routing and scheduling. Routing, date sets and shipping sets will be stored in the shipment planning database, after which delivery validation will be carried out in preparation for shipment. Model business process analysis for routing and scheduling, and shipping execution is as shown in Figure 14.

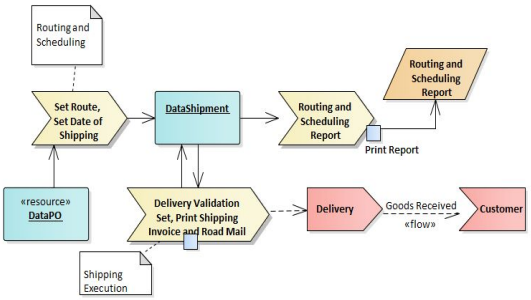

Figure 14. BPM routing and scheduling, and shipping execution

To increase customer trust, upon delivery accompanied by travel documents (road mail) and shipping invoices. After the customer receives the item according to the PO, the customer signs the shipping invoice. The format of shipping invoice and road mail depends on the logistics policy and the respective supply chain. The business process model shipping invoice and road mail are as shown in Figure 15.

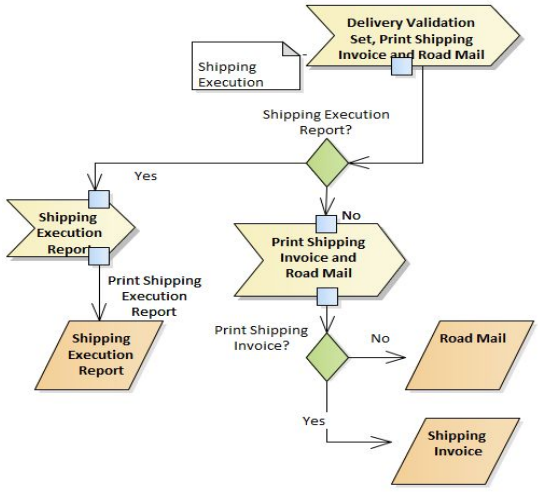

Figure 15. BPM shipping invoice and road mail

Based on the business process model, it can be seen that information sharing can improve the performance of trust and trustworthiness in logistics and supply chains, especially relationships, collaboration, partnerships and benchmarks. Agroindustry product customers make a relationship with retailers by sending PO, and then retailers will process PO. Before delivery, check availability stock is carried out, if the stock is insufficient, the retailer will send retail demand to the distributor so that customer demand (PO) can be fulfilled. To increase trust performance after sending customer demand, the customer signs a shipping invoice. Based on the new framework, it is expected to improve performance trust in the agroindustry logistics and supply chain.

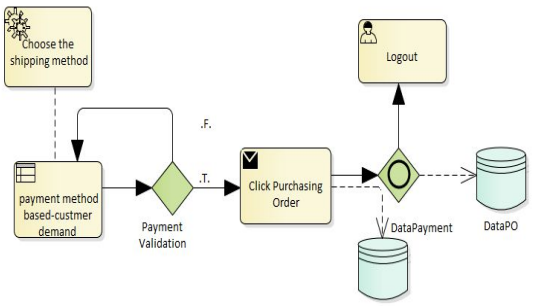

Figure 16. BPM Notation Payment Validation

In the new framework the contract between customer agro-industry products and retailers is carried out using smart contracts based on information technology. When customers choose products as customer demand, customers make payments online. Payment transactions are recorded in the database payment which will be used as the basis for making shipment planning.

7 Conclusions and recommendations

The reviewed articles were categorized into contract, competencies, goodwill, and performance trust and trustworthiness. Future research development is related to the potential identified in this study by the important role of management in managing and maintaining trust. The interaction approach and the impact of collaborative relationships and performance in logistics and supply chain activities on agroindustry have been applied by most of the previous researchers. The dominant methods we found in literature were contractual and impact on relationship quality. Most of the literature focuses on managing trust relationships and there is a lack of discussion about the relationship of trust in shipment planning, routing and scheduling, shipping execution and inventory control process performance.

The main novelty of this paper is focuses on assessing the importance of trust and trustworthiness in the four levels of logistics and supply chain activities namely shipping planning, routing and scheduling, shipping execution and inventory control processes. The contribution of this paper was mapping the method in relationship of trust, trustworthiness and develop new framework. This paper developed and suggested a new framework for maintaining trust and trustworthiness in the agroindustry logistic and

supply chain model by using Enterprises Architect Version 14.0. Based on the business process model, it can be seen that information sharing can improve the performance of trust and trustworthiness.

For further research, it is necessary to discuss the trust associated with sharing information in addition to relationships, collaboration, partnership and goodwill. In addition, smart contracts related to agroindustry logistics and supply chain can be further developed.

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